PET Scans Ontario Indications List

For the most up-to-date indications information, please visit www.CCOHealth.ca/PET.

This document provides a high-level overview of funded indications. As with all testing, there may be additional criteria impacting individual patient eligibility. Contact your PET centre of choice for more information.

Not all indications are available at all PET Centres. Contact PET Scans Ontario (1-877-473-8411) or your PET centre of choice if you have questions.

Indications refer to 18F-Fluourodeoxyglucose (FDG)-PET scanning, unless otherwise specified.

For patients who may benefit from a PET scan, but do not meet the eligibility criteria to receive a PET scan for one of the listed indications, referring physicians may wish to apply for a PET scan for their patient through the PET Access Program.

Category **Page**

Cardiology

Current Indications/Recommendations:

- Myocardial Viability……..Cardiac FDG PET Requisition

  Eligibility Criteria:
  PET in a patient being considered for cardiac revascularization, cardiac transplantation, or other cardiac procedures with either: moderate to severe ischemic left ventricular dysfunction (left ventricular ejection fraction of 40% or less) despite maximal therapy; OR moderate to severe persistent perfusion abnormality without significant (moderate or severe) ischemia.

- Cardiac Sarcoidosis……..Cardiac FDG PET Requisition

  Eligibility Criteria:
  - PET for patients with biopsy proven or clinical diagnosis of pulmonary or systemic sarcoidosis and in whom obstructive coronary disease has been ruled out, to screen for cardiac involvement
  - PET for patients (age ≤70 years) presenting with unexplained significant conduction system disease (defined as high grade Mobitz II 2nd degree or 3rd degree AV block), to screen for cardiac sarcoidosis as underlying etiology
  - PET for patients with proven cardiac sarcoidosis (with a positive baseline FDG PET scan) to assess for response to treatment when considering a change in treatment, or to assess for disease relapse. A maximum of 3 follow-up scans may be booked up to 3 years post initial diagnostic FDG PET scan.

- Cardiomyopathy & Ventricular Arrhythmia……..Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients with unexplained cardiomyopathy and associated ventricular tachycardia or fibrillation
  - Ventricular arrhythmia in the setting of unexplained cardiomyopathy, despite adequate investigation, including referral/consultation with an EP (electrophysiology) specialist

- Device Infections……..Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients with suspected infection of pacemaker, ICD, CRT, or left ventricular assist devices (LVAD) where there is a high clinical suspicion and/or laboratory evidence of infection.
  - Generator, pocket, and/or endovascular lead infection
    OR
  - The diagnosis of infection has been made and there is suspected extra-cardiac complications (i.e. septic emboli)

- Infective Endocarditis/Graft Infection……Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients where, using modified Duke criteria, there is a high clinical suspicion and/or laboratory evidence of infection, including graft infection of aortic or iliac grafts
  - Rejected infective endocarditis (according to modified Duke Criteria), but clinical suspicion is high
  - Definite infective endocarditis or graft infection with:
    - Suspicion of extra-cardiac complications (i.e. septic emboli)
    - Suspicion of cardiac complications (e.g. perivalvular abscess)
  - High clinical suspicion for infected graft (including positive blood culture)

- Myocarditis……Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients where there is a high clinical suspicion and/or laboratory evidence of myocarditis
  - Recurrent myocarditis/symptoms or lack of LV function recovery despite adequate treatment of the initial episode
  - Persistent elevated troponin levels
  - Chest pain or shortness of breath, signs and symptoms of myocarditis post mRNA vaccine where knowledge of extent of inflammation would change management

- Pericarditis……Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the diagnosis and clinical management of patients where there is a high clinical suspicion or lab evidence of pericarditis
  - Persistent symptoms despite 2 weeks of adequate therapy
  - Recurrent pericarditis/symptoms despite adequate treatment of the initial episode
  - Assess response to therapy 4 weeks after therapy initiation

- Vasculitis/Aortitis……Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the diagnosis and determination of clinical management of patients where there is a high clinical suspicion (including elevated inflammatory biomarker with negative imaging or biopsy workup and/or laboratory evidence of vasculitis/aortitis, such as large vessel vasculitis (LVV) or Polymyalgia Rheumatica (PMR)

- Other Cardiovascular Infection or Inflammatory Processes……Cardiac Special Access Program PET Requisition

  Eligibility Criteria:
  PET for the evaluation of patients with suspicion of cardiovascular infection/inflammatory processes (i.e., assessment of cardiac masses, rheumatologic disorders or systemic multiple differential inflammatory diagnoses based on MRI/CT imaging). Compelling evidence may be submitted via the Cardiac PET Special Access Program.

- Myocardial Perfusion (**Rb-PET**)……Contact Cardiac PET Centre of Choice Directly

  Eligibility Criteria:
  Stress PET for the assessment of patients with known or suspected coronary artery disease (CAD) with an intermediate (10-90%) pre-test likelihood of significant ischemia secondary to coronary stenosis where:
  - there is a high likelihood of attenuation artifact with SPECT imaging, or
  - a high degree of functional accuracy or quantitative flow measurements is required, or
  - functional imaging is required and a low radiation dose is preferable (such as younger patients), or
  - the results of prior non-invasive imaging are equivocal or inconclusive, or
  - in patients with known CAD where the need for intervention is uncertain

  Quantitative PET flow imaging may be particularly helpful when there is a need for absolute MBF measurements, such as:
  - Patients without known CAD who present with symptoms suspect for ischemia
  - Patients with known CAD,where specific physiological assessment is desired
  - Identifying patients with an increased suspicion for multivessel CAD
  - To assess possible microvascular dysfunction
  - Heart transplant patients when there is a question of vasculopathy

Neurology/Dementia

Current Indications/Recommendations:

- Epilepsy – medically-intractable……Epilepsy PET Registry Form

  Eligibility Criteria:
  PET for patients with medically-intractable epilepsy being assessed for epilepsy surgery

- Paraneoplastic Syndrome……PNS Expedited PET Access Request Form

  Eligibility Criteria:
  PET for the evaluation of patients with suspected paraneoplastic neurologic syndromes with negative conventional imaging, with or without positive onconeuronal antibodies

Oncology

Breast Cancer……Breast PET Request Form

Current Indications/Recommendations:

- Locally Advanced Invasive Ductal Breast Cancer

  Eligibility Criteria:
  PET for the staging of patients with histologically confirmed clinical stage IIb or stage III breast cancer being considered for curative intent combined modality treatment (surgical resection, chemotherapy, radiotherapy); and/or repeat PET on completion of neoadjuvant therapy, prior to surgery (when there is clinical suspicion of progression); **OR**

  PET for Re-staging of patients with locoregional recurrence, after primary treatment, being considered for ablative/salvage therapy.

- Oligometastatic Invasive Ductal Breast Cancer

  Eligibility Criteria:
  PET for staging/re-staging of patients with oligometastatic disease (≤ 4 metastases) on conventional imaging prior to radical intent/ablative therapy.

Dermatology……Melanoma PET Request Form

Current Indications/Recommendations:

- Melanoma (Staging)

  Eligibility Criteria
  PET for the staging of patients with localized "high risk" melanoma, or for the evaluation of patients with isolated melanoma metastases when surgery or other ablative therapies are being considered

- Metastatic Melanoma (Immunotherapy)

  Eligibility Criteria
  - Baseline Staging: PET for the staging of patients prior to starting immunotherapy
  - Early Response Assessment: PET after 2-4 cycles of immunotherapy for early response assessment of patients with metastatic melanoma currently receiving immunotherapy
  - End of Therapy Response Assessment: PET for response assessment of patients with metastatic melanoma at end of immunotherapy

Gastrointestinal (GI) Cancers……GI PET Request Form

Current Indications/Recommendations:

- Esophageal/GE Junction

  Eligibility Criteria
  PET for baseline staging assessment of those patients diagnosed with esophageal/GE Junction cancer being considered for curative therapy and/or repeat PET/CT scan on completion of pre-operative/ neoadjuvant therapy, prior to surgery; or for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy.

- Colorectal (apparent limited metastatic)

  Eligibility Criteria:
  PET for the staging/re-staging for patients with apparent limited metastatic disease (e.g., organ-restricted liver or lung metastases); or limited local recurrence, who are being considered for radical intent therapy
  Note: *as chemotherapy may affect the sensitivity of the PET scan, it is strongly recommended to schedule PET at least 6 weeks after last chemotherapy, if possible.*

- Colorectal (recurrent)

  Eligibility Criteria:
  PET where recurrent disease is suspected on the basis of an elevated and/or rising carcinoembryronic antigen (CEA) level(s) during follow-up after surgical resection but standard imaging tests are negative or equivocal.

- Anal Canal (staging/restaging)

  Eligibility Criteria:
  PET for the initial staging of patients with clinical stage II-IV squamous cell carcinoma of the anal canal.

Genitourinary (GU) Cancers

Current Indications/Recommendations:

- Bladder (Muscle Invasive)……GU PET Request Form

  Eligibility Criteria:
  PET for the staging of patients with newly diagnosed muscle-invasive high grade urothelial carcinoma of the bladder being considered for curative intent treatment with either radical cystectomy or radiation-based bladder preservation therapy; TNM stage T2a-T4a, N0-3, M0

- Germ Cell Tumours (recurrent/persistent disease)……..GU PET Request Form

  Eligibility Criteria:
  - PET where recurrent disease is suspected on the basis of elevated tumour marker(s) - (beta human chorionic gonadotrophin (HCG) and/or alpha fetoprotein) and standard imaging tests are negative; OR
  - Where persistent disease is suspected on the basis of the presence of a residual mass after primary treatment for seminoma when curative surgical resection is being considered

- Prostate (**PSMA PET**)……PSMA-PET Request Forms
  Forms: PSMA-PET Request Form + Eligibility Form A + Consent Form (where relevant) + PREP Access Request Form for Cohort 7 patients

  Eligibility Criteria:
  Prostate Specific Membrane Antigen (PSMA) PET in the following patient populations:
  - Initial staging of patients with a new diagnosis of high-risk prostate cancer being considered for radical (curative) therapy; OR
  - Staging of patients with recurrent prostate cancer who fall into one of the following pre-defined cohorts:
    - Post-prostatectomy node positive disease or persistently detectable PSA
    - Biochemical failure post-prostatectomy
    - Biochemical failure following radical prostatectomy followed by adjuvant or salvage radiotherapy
    - Rising PSA post-prostatectomy despite salvage hormone therapy
    - Biochemical failure following treatment for oligometastatic disease
    - Biochemical failure following primary radiotherapy
    - Rising PSA and/or progression on conventional imaging despite prior second line hormone therapy or chemotherapy for castrate resistant prostate cancer
    - Where confirmation of site of disease and/or disease extent may impact clinical management over and above the information provided by conventional imaging (requires a case-by-case review)

Gynecological Cancers……Gynecology PET Request Form

Current Indications/Recommendations:

- Cervical Cancer (staging)

  Eligibility Criteria:
  PET for the staging of locally advanced cervical cancer when:
  - CT/MR shows positive or indeterminate pelvic nodes (>7mm and/or suspicious morphology) OR
  - CT/MR shows borderline or suspicious para-aortic OR
  - CT/MR shows suspicious or indeterminate distant metastases (e.g., chest nodules)

- Gynecology (recurrent, prior to salvage therapy)

  Eligibility Criteria:
  PET for re-staging of patients with recurrent gynecologic malignancies under consideration for radical salvage surgery (e.g., pelvic exenteration)

Head & Neck (H&N) Cancers……H&N PET Request Form

Current Indications/Recommendations:

- Unknown Primary

  Eligibility Criteria:
  PET for the evaluation of metastatic squamous cell carcinoma in neck nodes when the primary disease site is unknown after standard radiologic and clinical investigation
  Note: *a panendoscopy is NOT required prior to the PET scan*

- Nasopharyngeal (baseline staging)

  Eligibility Criteria:
  PET for the staging of nasopharyngeal cancer
  Note: *for cervical esophageal cancer, see Gastrointestinal Cancers.*

- H&N Node Positive (baseline staging)

  Eligibility Criteria:
  PET for the baseline staging of node positive (N1-N3) H&N cancer where PET will impact radiation therapy (e.g., radiation volume / dose)

- H&N (re-staging after chemoradiotherapy)

  Eligibility Criteria:
  PET to assess patients with N1-N3 metastatic squamous-cell carcinoma of the H&N after chemoradiation (HPV negative); or who have residual neck nodes ≥ 1.5cm on re-staging CT performed 10-12 weeks post therapy (HPV positive).

- Thyroid (recurrent)

  Eligibility Criteria:
  PET where recurrent or persistent disease is suspected on the basis of elevated and/or rising tumour markers (e.g., thyroglobulin) with negative or equivocal conventional imaging work-up.

- Anaplastic Thyroid (staging)

  Eligibility Criteria:
  PET for the staging of histologically proven anaplastic thyroid cancer with negative or equivocal conventional imaging work-up.

- Medullary Thyroid (staging & recurrent)

  Eligibility Criteria:
  PET for the baseline staging of histologically proven medullary thyroid cancer being considered for curative intent therapy or where recurrent disease is suspected on the basis of elevated and/or rising tumour markers (e.g., calcitonin) with negative or equivocal conventional imaging work-up.
  Note: *Complete the Ga68-DOTATATE PET Requisition Form if you'd prefer your patient receive a Ga68-DOTATATE PET scan instead of an FDG PET scan.*

- Esophageal/GE Junction

  Eligibility Criteria

  PET for baseline staging assessment of those patients diagnosed with esophageal/GE Junction cancer being considered for curative therapy and/or repeat PET/CT scan on completion of pre-operative/ neoadjuvant therapy, prior to surgery; or for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy.

Hematological Cancers

Current Indications/Recommendations:

- Lymphoma ……Lymphoma PET Request Form

  Eligibility Criteria:
  - Staging (Adults & Pediatrics): PET for the baseline staging of patients with Hodgkin's or non-Hodgkin's lymphoma

  - Interim response assessment:
    - **Hodgkin's** (Adults & Pediatrics): PET for the assessment of response in Hodgkin's lymphoma following two (2) or three (3) cycles of chemotherapy when curative therapy is being considered OR

    - **Non-Hodgkin's** [Pediatrics only (<18 years old; or ≤20 years old and treated at a pediatric centre):] PET for the assessment of response in non-Hodgkin's lymphoma after a minimum of two (2) cycles of chemotherapy when curative therapy is being considered

  - End of therapy response assessment (Adults & Pediatrics):
    - PET for the evaluation of residual mass(es) or lesion(s) (e.g., bone) following chemotherapy in a patient with Hodgkin's or non-Hodgkin's lymphoma when further potentially curative therapy (such as radiation or stem cell transplantation) is being considered OR

    - PET To assess response to chimeric antigen receptor (CAR) T-cell therapy, ninety (90) days post transfusion

- Myeloma/Plasmacytoma…….MM/Plasmacytoma PET Registry Request Form

  Eligibility Criteria:
  To evaluate the impact of PET on the management of patients with plasmacytoma/myeloma for the following indications:
  - Solitary plasmacytoma: for patients with presumed solitary plasmacytoma who are candidates for curative intent radiotherapy [to determine whether solitary or multifocal/extensive disease]

  - Smoldering myeloma: Workup of patients with smoldering myeloma [to determine whether smoldering or active myeloma]

  - Nonsecretory myeloma, oligosecretory myeloma, or POEMS: Baseline staging and response assessment.

  - Newly-Diagnosed Secretory Multiple Myeloma: Workup of patients with newly-diagnosed secretory multiple myeloma

Neuroendocrine Tumours (NETs)……Ga68-DOTATATE Request Form

Current Indications/Recommendations:

- Diagnosis

  Eligibility Criteria:
  - PET for the evaluation of a pancreatic, small bowel or mesenteric mass with findings suggestive of a NET (e.g., hypervascular pancreatic mass, desmoplastic mesenteric mass) on conventional imaging; OR
  - PET for the evaluation of extra-adrenal mass (e.g., carotid body nodule), with conventional imaging and/or elevated biomarkers suggestive of a pheochromocytoma/paraganglioma (PPGL); OR
  - PET for a patient with a genetic syndrome predisposing to NETs and a biochemical and/or morphological suspicion of a NET in whom PET results would measurably impact management

- Initial Staging

  Eligibility Criteria:
  PET for a histologically proven well-differentiated NET (G1-G3), including unknown primary, or pheochromocytoma/paraganglioma (PPGL)
  Note: *PET should be requested within 1 year from the initial diagnosis*

- Re-staging

  Eligibility Criteria:
  - PET for a patient with progressive NETs disease and is being considered for publicly funded Peptide Receptor Radionuclide Therapy (PRRT); OR
    Note: *PET should be completed within 12 months. However, a more recent scan should be considered if there are concerning clinical features (e.g., de-differentation)*
  - New baseline PET scan for patients with new metastatic disease on conventional imaging and/or clinical suspicion of de-differentiation; OR
  - PET for a patient with NETs disease when surgery (e.g., de-bulking, focal ablation, liver-directed therapy) is being considered; OR
  - PET for a patient with NETs disease where conventional imaging is negative or equivocal at the time of clinical and/or biochemical progression

Sarcoma……Sarcoma PET Request Form

Current Indications/Recommendations:

- Sarcoma (Initial Staging/Re-staging)

  Eligibility Criteria:
  PET for the initial staging of patients with histologically confirmed high grade (≥ Grade 2), or ungradable, soft tissue or bone sarcomas, when conventional workup is negative or equivocal for metastatic disease, prior to curative intent therapy; OR for re-staging of patients with suspicion of, or histologically confirmed, recurrent sarcoma (local recurrence of limited metastatic disease) when radical salvage therapy is being considered.

- Plexiform Neurofibromas (Diagnosis)

  Eligibility Criteria:
  PET for patients with suspicion of malignant transformation of plexiform neurofibromas.

Thoracic Cancers……Thoracic PET Request Form

Current Indications/Recommendations:

- Esophageal/GE Junction

  Eligibility Criteria
  PET for baseline staging assessment of those patients diagnosed with esophageal/GE Junction cancer being considered for curative therapy and/or repeat PET/CT scan on completion of pre-operative/ neoadjuvant therapy, prior to surgery; or for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy.

- Lung – Non-Small Cell Lung Cancer (NSCLC; Clinical Stage I-III)

  Eligibility Criteria
  PET for initial staging of patients with NSCLC (Clinical Stage I – III) being considered for potentially curative therapy; OR for re-staging of patients with locoregional recurrence, after primary treatment, being considered for definitive salvage therapy
  Note: *Histological proof is not required prior to PET if there is high clinical suspicion for NSCLC (e.g., based on patient history and/or prior imaging)*
  Note: *PET is appropriate for patients with either histological proof of locoregional recurrence or strong clinical and radiological suspicion of recurrence who are being considered for definitive salvage therapy*

- Lung – Small Cell Lung Cancer (SCLC; Clinical Stage I-III)

  Eligibility Criteria
  PET for initial staging of patients with limited disease SCLC where combined modality therapy with chemotherapy and radiotherapy is being considered

- Lung – Solitary Pulmonary Nodule (SPN)

  Eligibility Criteria
  PET for a **semi-solid or solid** lung nodule for which a diagnosis could not be established by a needle biopsy due to unsuccessful attempted needle biopsy; the SPN is inaccessible to needle biopsy; or the existence of a contra-indication to the use of needle biopsy

- Lung – Mesothelioma

  Eligibility Criteria
  PET for the staging of patients with histologic confirmation of malignant mesothelioma

Pediatric Oncology

Current Indications/Recommendations:

- Pediatric Oncology Registry…… PET Scans Ontario eTool online request

  Eligibility Criteria

  Pediatric Registry Indications (data collection/partnership with POGO):

  - For the following cancer types (ICCC)
    - Bone/Cartilage - Osteosarcoma, Ewings sarcoma
    - Connective/Other soft tissue - Rhabdomyosarcoma, Other
    - Kidney - Renal Tumour
    - Liver - Hepatic Tumour
    - Lymphoma/PTLD – **See Hematological Oncology Section**……..Page 11
    - Primary Brain - Astrocytoma, Medulloblastoma, Ependymoma, Other
    - Reproductive - Germ Cell Tumour
    - Sympathetic Nervous System - Neuroblastoma MIBG negative
    - Other – LCH, Melanoma of the Skin, Thyroid
  - For the following indications
    - Initial Staging
    - Monitoring response during treatment/determine response-based therapy
    - Rule out progression prior to further therapy
    - Suspected recurrence/relapse
    - Rule out persistent disease
    - Select optimal biopsy site